

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Marie Thomas Gilles Raffle      Art Unit : Unknown  
Serial No. :    Examiner : Unknown  
Filed : May 25, 2006  
Title : CASTING OF METAL ARTEFACTS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as indicated on the following pages.

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A process for casting a metal artefact by forming a molten charge of metal from a precursor thereof, charging a die or mould with the molten charge to fill the die or mould sufficiently to form a single metal artefact and causing or allowing the charge to solidify in the die or mould to form the artefact, the process ~~[being characterized in that it includes]~~ including the step of selecting the size of the molten charge to match the capacity of the die or mould so that the charging of the die or mould consumes substantially the whole molten charge, the process including the steps whereby, in combination, the charging of the die or mould is from a hollow cylinder or sleeve by means of a telescopic piston arrangement which elevates the cylinder or sleeve into engagement with the die or mould and into communication with a charging opening into the die or mould and a central piston of the piston arrangement enters the cylinder or sleeve and slides upwardly therein in sealing engagement therewith during the charging, while a peripheral piston of the piston arrangement, surrounding the central piston, urges the cylinder or sleeve upwardly into sealing engagement with the die or mould around the charging opening of the die or mould.

2. (Currently Amended) A process as claimed in Claim 1, ~~[characterized in that]~~ in which forming the molten charge is from a precursor thereof which is a metal billet or ingot or a compact of metal particles.

3. (Currently Amended) A process as claimed in Claim 1 ~~[or Claim 2, characterized in that it]~~ which includes heating the metal of the molten charge, after forming the molten charge, to raise the temperature of the molten charge, prior to filling the die or mould with the molten charge at the raised temperature.

4. (Currently Amended) A process as claimed in [~~any one of Claims 1—3 inclusive, characterized in that~~] Claim 1, in which the charging is carried out by injection moulding at an intermediate pressure in the range 50 KPa - 30MPa.

5. (Currently Amended) A process as claimed [~~in any one of the preceding claims, characterized in that it~~] Claim 1, which includes the step of purging the environment in which the molten charge is formed with a purging gas, prior to and during the forming of the molten charge.

6. (Currently Amended) A process as claimed in [~~any one of the preceding claims, characterized in that it~~] Claim 1, which includes using, as the metal, a metal selected from the group consisting of aluminium, magnesium, lithium, zinc and alloys thereof.

7. (Currently Amended) A process as claimed in Claim 6, [~~characterized in that it~~] which includes using, as the metal, a light metal selected from the group consisting of magnesium, aluminium and alloys thereof.

8. (Currently Amended) A process as claimed in Claim 7, [~~characterized in that~~] in which the casting is of a light metal artefact in the form of a motor vehicle wheel rim.

9. (Currently Amended) A process as claimed in [~~any one of the preceding claims, characterized in that~~] Claim 1, in which the casting is of a metal artefact in which all the parts of the solidified artefact are spaced from the closest part of the surface of the artefact by a spacing of 0.75 – 15mm, the artefact having a mass of 0.25 – 30 kg.

10. (Currently Amended) A casting apparatus or installation ~~[(50)]~~ for casting a metal artefact in a die or mould, the casting apparatus or installation ~~[(50)]~~ including a die or

mould [(54)] and a melting apparatus [(10)] which includes a container [(12)] for holding a precursor of a molten charge of metal, a heating arrangement [(16)] for heating the precursor in the container [(12)] to form a molten charge of metal, and a molten metal transfer assembly [(20)] for transferring a molten charge of metal from the container [(12)] to the die or mould [(54)], ~~[the casting apparatus or installation being characterized in that]~~ the container [(12)] and die or mould [(54)] having [(have)] capacities which are matched so that charging of the die or mould [(54)] from the container [(12)] to fill the die or mould [(54)] with a charge sufficient to form a single metal artefact consumes substantially the whole charge of molten metal from the container [(12)] and leaves the container [(12)] empty,

~~the [apparatus or installation being characterized in that, in combination,~~

~~the]~~ container [(12)] is being a hollow cylinder or sleeve [(14)], the molten metal transfer assembly (20) being [(,)] a telescopic piston arrangement [(24)] for elevating the cylinder or sleeve [(14)] into engagement with the die ~~[(or)]~~ or mould [(54)] and into communication with a charging opening [(62)] into the die or mould [(54)] and the piston arrangement [(24)] ~~has~~ having a central piston [(28, 30)] for entering the cylinder or sleeve [(14)] and for sliding upwardly therein in sealing engagement therewith, the piston arrangement [(24)] having a peripheral piston [(37)] surrounding the central piston [(28, 30)] for urging the cylinder or sleeve [(14)] upwardly into sealing engagement with the die or mould [(54)] around the charging opening [(62)] of the die ~~[(or)]~~ or mould [(54)].

11. (Currently Amended) An apparatus or installation as claimed in Claim 10, ~~[characterized in that]~~ in which the heating arrangement is mounted on the molten metal transfer assembly.

12. (Currently Amended) An apparatus or installation as claimed in Claim 10 ~~[or Claim 11, characterized in that]~~ in which the melting apparatus is reciprocable relative to the die or mould between a charging position where charging of the melting apparatus takes place and a

filling position where transfer of a molten charge from the melting apparatus to the die or mould takes place.

13. (Currently Amended) An apparatus or installation as claimed in [~~any one of Claims 10-12 inclusive, characterized in that it~~] Claim 10, which includes an inert gas supply (22) for supplying inert gas to the container, to permit forming of the molten charge to take place under an inert atmosphere.

14. (Currently Amended) An apparatus or installation as claimed in [~~any one of Claims 10-13 inclusive, characterized in that~~] Claim 10, in which the container has a hollow cylindrical interior.

15. Cancelled.

16. Cancelled.

17. (Currently Amended) An apparatus or installation as claimed in Claim [14, ~~characterized in that the central piston has a piston head (30) provided with a sealing surface (34)~~] 10, in which for sealingly engaging the periphery of the charging opening of the die or mould.

18. (Currently Amended) An apparatus or installation as claimed in [~~any one of Claims 10-17 inclusive, characterized in that~~] Claim 10, in which the heating arrangement includes at least one induction coil surrounding the container.

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REMARKS

Applicant asks that all claims be examined in view of the amendment to the claims.  
Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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